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IS 7970 (1987): Tantalum Powder for Capacitors [MTD 25: Powder Metallurgical Materials and Products]

Act Number 22 of 2005
The Indian Parliament
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“Knowledge is such a treasure which cannot be stolen”

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AMENDMENT NO. 1 DECEMBER 2007
TO
IS 7970 : 1987 SPECIFICATION FOR TANTALUM POWDER FOR CAPACITORS

(First Revision)

[*Page* 1, *clause* 2(a)] — Substitute 'less than 25 V' *for* 'less than 50 V'.

[*Page* 1, *clause* 2(b)] — Substitute '25-125 V' *for* '50-125 V'.

(*Page* 1, *clause* 3) — Substitute 'IS 1387 : 1993' *for* 'IS1387 : 1967' and '*second revision*' *for* '*first revision*'.

(*Page* 1, *Table* 1) — Substitute the following for the existing table.

Table 1 Chemical Composition of Tantalum Powder for Capacitors

Constituent	Grade 1 (Sodium-Reduced) ppm, *Max*	Grade 2 (Electron Beam Refined/ Hydride — Dehydride) ppm, *Max*
O	2 200	1 800
H	30	20
C	60	30
N	80	40
Al	10	5
Cr	25	10
Cu	5	5
Fe	35	20
Mg	10	5
Mn	10	10
Mo	10	10
Na	10	5
Nb	10	10
Ni	35	10
Si	25	10
Sn	10	5
Ti	5	5
Zr	10	5
W	25	25
K	10	10

(MTD 25)

Reprography Unit, BIS, New Delhi, India

UDC 669·294-492·2 : 621·319·45 (First Reprint DECEMBER 1997) **IS : 7970 - 1987**

Indian Standard

SPECIFICATION FOR TANTALUM POWDER FOR CAPACITORS

(First Revision)

1. Scope — This standard specifies the requirements of tantalum powder used in the manufacture of capacitors.

2. Grades — The following two grades of tantalum powder are covered in this standard:

a) *Grade* 1 — Powder (sodium reduced) meant for high capacitance devices at low voltage ratings (less than 50 V).

b) *Grade* 2 — Powder (electron beam refined, hydride-dehydride) meant for high reliability capacitance ratings (50-125 V range).

3. Supply of Material — General requirements relating to the supply of tantalum powder shall conform to IS : 1387-1967 'General requirements for the supply of metallurgical materials (*first revision*).

4. Chemical Composition — The chemical composition of the material shall be as given in Table 1.

TABLE 1 CHEMICAL COMPOSITION OF TANTALUM POWDER FOR CAPACITORS

Constituent	Grade 1 (Sodium-Reduced) ppm, *Max*	Grade 2 Electron Beam Refined (Hydride-Dehydride) ppm, *Max*
O	2 400	1 650
H	30	30
C	100	45
N	90	40
Al	10	5
Cr	25	5
Cu	10	5
Fe	50	30
Mg	10	5
Mn	10	10
Mo	100	20
Na	10	5
Nb	50	20
Ni	50	5
Si	25	10
Sn	10	5
Ti	10	5
Zr	10	5
W	25	25

4.1 The method of chemical analysis shall be as agreed to between the purchaser and the manufacturer.

Powder Metallurgical Materials and Products Sectional Committee, SMDC 30 [Ref : Doc : SMDC 30 (3095)]

Adopted 1 December 1987

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Gr 1

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

5. Physical Properties — The physical properties of the material shall be as given in Table 2.

TABLE 2 PHYSICAL PROPERTIES OF TANTALUM POWDER FOR CAPACITORS

Sl No.	Characteristics	Grade 1	Grade 2
i)	Bulk density (Scott density), g/cm^3	1·6 to 2·0	3·5 to 4·0
ii)	Average particle size range (Fisher subsieve sizer), µm	2·5 to 3·5	6·5 to 8·5
iii)	Particle size distribution		
	Mesh	*Percent*	*Percent*
	+200	10 to 25	15 to 35
	−200+325	10 to 20	5 to 10
	−325	45 to 70	45 to 60

5.1 The bulk density (Scott density) shall be determined in accordance with IS : 11627-1986 'Method for determination of apparent density of metallic powders by Scott volumeter'.

5.2 The average particle size shall be determined in accordance with IS : 7512-1974 'Method for determination of average particle size of metal powders by Fisher subsieve sizer'.

5.3 Particle size distribution shall be determined in accordance with IS : 5461-1984 'Methods for sieve analysis of metal powders (*first revision*)'.

6. Sampling — The sampling of powder for conducting all the tests shall be done in accordance with IS : 6492-1972 'Methods for sampling of powders for powder metallurgical purposes'.

7. Packing — The powder shall be supplied packed under argon in suitable containers, in quantities as agreed to between the purchaser and the manufacturer.

8. Marking — Each container of tantalum powder shall be marked with the following information:

a) Tantalum powder for capacitor,
b) Grade of powder,
c) Manufacturer's name,
d) Batch number and date of manufacture of powder, and
e) Net mass of powder in the container.

8.1 *Standard Marking* — The powder may also be marked with the Standard Mark. The details of standard marking is available with the Bureau of Indian Standards.

EXPLANATORY NOTE

This standard was first published in 1979. While reviewing this standard in the light of experience gained by the indigenous industry, the Sectional Committee decided to revise the standard. In this revision, the following modifications have been made:

a) Three grades have been reduced to two grades,
b) Chemical composition and physical properties have been modified,
c) Clause on testing of sintered anodes has been deleted, and
d) Marking clauses have been modified.

Reprography Unit, BIS, New Delhi, India